UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
NOLAN, PETER D

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>17 July 2009</u>.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-15</u> is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) <u>1-15</u> is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on <u>12 June 2008</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All b)☐ Some * c)☐ None of:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____.
   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The amendment to the claims filed July 17, 2009 has been entered. Claims 1-15 remain pending.

The rejections of claims 1-3 under 35 U.S.C. 101 have been withdrawn in light of the amendment / response.

The amendment to the specification filed July 17, 2009 has been entered.

The objections to paragraphs 22-24 for minor informalities have been withdrawn in light of the amendment / response.

Response to Affidavit

The affidavit filed on July 17, 2009 under 37 CFR 1.131 has been considered but is ineffective to overcome the Clark (US 2005/0033549 A1) reference, hereinafter referred to as Clark '549.

The affidavit successfully antedates the 7/21/2004 filing date of the Clark '549 reference due to the evidence regarding applicant's provisional application number 60/555,480. However, the Clark reference claims priority under 35 U.S.C. 119(e) to provisional application number 60/490,409 which was filed on 7/25/2003, hereinafter referred to as Clark '409. Support for the cited teaching in the Clark '549 reference is found in the Clark '409 reference. Therefore, the effective filing date of the cited teaching in the Clark '549 reference is the 7/25/2003 filing date of the Clark '409 patent and applicant's affidavit is ineffective to overcome the Clark '549 reference.

Double Patenting

1.   The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2.   Claim 1 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 2 of U.S. Patent No. 7165008 B2 in view of Clark (US 2005/0033549 A1). This double patenting rejection is necessitated by the amendment filed 7/17/2009.

3.   Claim 2 of the '008 patent is directed to a method for "detecting a rollover event of a vehicle" that comprises the same limitations as applicant's claimed method for "detecting a potential for a vehicle rollover event", with the exception of: (1) the step of measuring a tire load, (2) and weighting the rollover potentiality index by a factor of the tire load in addition to a factor of the lateral acceleration. In addition, the '008 patent contains an additional limitation of "detecting said rollover event in response to said rollover index being above said predetermined threshold" that is not found in applicant's claimed method.

4. Clark teaches a method for detecting a rollover potential for a vehicle that comprises, in part, measuring a tire load (**see Clark figure 5, loads F_L, F_R and paragraphs 8, 29, 30**) and weighting a rollover potential by a factor of the tire load (**see Clark paragraph 22**).

5. It would be obvious to one skilled in the art to add the steps of measuring a tire load and weighting a rollover potential by a factor of the tire load, as taught in Clark, to the method in claim 2 of the '008 patent because the tire load can provide a quick indication of an extreme change in vehicle orientation (**see Clark paragraph 24**).

6. The '008 patent includes the limitation "detecting said rollover event in response to said rollover index being above said predetermined threshold" that is not found in the current application. However, the current application would inherently detect a rollover event when it is determined that the rollover index is above the predetermined threshold because the controller in claim 1 of the current application is configured to provide a control action in response to the outputted indication based on the rollover index and this control action, as defined in the specification, is designed to counteract an anticipated rollover (**see paragraph 37 in the specification of the current application**).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5, 9, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson (US 7057503 B2) in view of Yeh et al. (US 6542073 B2) and Clark (US 2005/0033549 A1).

3. **Regarding claim 1**, Watson teaches a method for detecting a potential for a vehicle rollover event **(see Watson abstract)**, the method comprising the steps of: determining a lateral kinetic energy of the vehicle based on the vehicle longitudinal velocity and the vehicle side slip angle **(see Watson column 28, lines 25-59 where the lateral kinetic energy may be determined as $1/2 * mass_{veh} * Velocity_{lat}^2$ and used to detect a potential rollover. It is well known in the art that the relationship between the side slip angle β, longitudinal velocity V_x and lateral velocity V_y is: $\beta = -arctan(V_y/V_x)$. Therefore the lateral kinetic energy is inherently based on the vehicle longitudinal velocity and the vehicle side slip angle**); measuring a lateral acceleration of the vehicle **(see Watson figure 3, Measures Algorithm 300.1; column 3, lines 8-18; column 4 lines 1-10)**;

4. However, while Watson teaches determining a rollover potential based on the lateral kinetic energy and the lateral acceleration **(see Watson column 28, line 53 thru column 29, line 15)**, it does not teach determining a rollover potentiality index based on the determined parameters. Furthermore, Watson does not teach measuring a tire load; determining a rollover index by weighing the rollover potentiality index by a factor of the lateral acceleration and a factor of the tire load and determining if the weighted index is above a predetermined threshold.

5.   Yeh teaches determining a rollover index based on determined parameters (**see Yeh column 3, lines 27-40**) and determining if a rollover index is above a predetermined threshold (**see Yeh column 3, lines 27-54**).

6.   It would be obvious to one skilled in the art to use the indexing function taught in Yeh to create a rollover potentiality index determined from the lateral kinetic energy and the lateral acceleration values determined in Watson because this enables the use of look-up table of predetermined threshold values responsive to the index values (**see Yeh column 3, lines 27-40**). It would further be obvious to determine if the resulting index is above a predetermined threshold, as further taught in Yeh, because this can signal that a rollover event may occur (**see Yeh column 8, lines 10-15**).

7.   Yeh further teaches weighting a rollover index by a factor of the lateral acceleration (**see Yeh column 5, line 63 thru column 6, line 14 where the lateral acceleration may be used to provide a safing function. See also column 8, lines 1-33 where if the rollover value is above a threshold, the output of the safing function is used**).

8.   Clark teaches a method for detecting a rollover potential for a vehicle that comprises, in part, measuring a tire load (**see Clark figure 5, loads F_L, F_R and paragraphs 8, 29, 30**) and weighting a rollover potential by a factor of the tire load (**see Clark paragraph 22**).

9.   It would be obvious to one skilled in the art to modify the rollover index taught in Watson, as modified with Yeh, with the lateral acceleration as further taught in Yeh because the lateral acceleration provides a safing function for the rollover detection

method (**see Yeh column 5, line 63 thru column 6, line 14**). It would further be obvious to modify the rollover index by a factor of the tire load, as taught in Clark, because the tire load can provide a quick indication of an extreme change in vehicle orientation (**see Clark paragraph 24**).

10.   **Regarding claim 2**, Watson, as modified by Yeh and Clark in claim 1, teaches where the measured tire load is a tire normal load (**see the rejection above regarding loads F_L, F_R**).

11.   **Regarding claim 5**, Watson, as modified by Yeh and Clark in claim 1, teaches where lateral acceleration of the vehicle is sensed using a lateral acceleration sensor (**see Watson column 3, lines 8-9 and column 5, lines 35-37**); the method further comprising sensing a yaw rate of the vehicle (**see Watson column 31, lines 9-15**), sensing a speed of the vehicle (**see Watson column 31, lines 9-15**), sensing a steering wheel angle of the vehicle (**see Watson column 31, lines 9-15**), and factoring the speed of the vehicle and the steering wheel angle of the vehicle into the rollover index determination (**see Watson column 31, lines 9-15 regarding determination of lateral velocity from the speed of the vehicle and the steering wheel angle. See also column 30, lines 52-67**).

12.   **Regarding claim 9**, Watson, as modified by Yeh and Clark in claim 1, teaches where the lateral acceleration of the vehicle is measured by an accelerometer attached to a center of gravity of the vehicle (**see Watson column 3, lines 8-12**).

13.   **Regarding claim 15**, Watson, in view of Yeh and Clark, teaches an apparatus for detecting a rollover event for a vehicle comprising: (**Watson figure 16, rollover**

detection system 10 containing lateral accelerometer 18; column 3, lines 8-12;

column 27, lines 57-60; a yaw rate sensor for sensing a yaw rate of the vehicle (**see**

Watson column 31, lines 9-12); a sensor for sensing a speed of the vehicle (**see**

Watson column 31, lines 9-15); a steering wheel sensor for sensing a steering wheel

angle of the vehicle (**see Watson column 31, lines 9-15**); a tire load sensing

mechanism for measuring a tire load (**see Clark figure 5, loads F_L, F_R and**

paragraphs 8, 29, 30); and a controller configured to factor the speed of the vehicle

and the steering wheel angle of the vehicle into the rollover index determination defined

in claim 1 (**see the rejection of claim 1 above. See also the rejection of claim 5**

above regarding factoring the speed of the vehicle and the steering wheel angle

of the vehicle into the rollover index determination defined in claim 1).

14.   Claims 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Watson (US 7057503 B2) in view of Yeh et al. (US 6542073 B2) and Clark (US

2005/0033549 A1) and further in view of Mancuso et al. (US 7404317 B2).

15.   **Regarding claim 3**, Watson, as modified by Yeh and Clark in claim 1, does not

teach where the measured tire load is determined by measuring a length of a contact

patch of a vehicle tire and measuring changes to the contact patch length.

16.   Mancuso teaches where a tire load may be determined by measuring a length of

a contact patch of a vehicle tire and measuring changes to the contact patch length

(**see Mancuso column 7, lines 33-39 and column 10, line 63 thru column 11, line**

19 where an accelerometer may be used to estimate the length PL_C of a contact

region between a tire and the road. See also column 11, lines 49-65 where the tire

load F_Z is derived from the length PL_C).

17. It would be obvious to one skilled in the art to determine the tire load in Watson, as modified by Yeh and Clark in claim 1, using the method taught in Mancuso because this method minimizes the effect of the cornering angle and camber angle on the determined tire load (**see Mancuso column 11, lines 12-19**).

18. **Regarding claim 4**, Watson, as modified by Yeh and Clark in claim 1 and further modified by Mancuso in claim 3, teaches where the length of the contact patch is quantified by at least one of an accelerometer, a pressure sensing mechanism, and a temperature sensing mechanism (**see the rejection of claim 3 above**).

19. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson (US 7057503 B2) in view of Yeh (US 6542073 B2) and Clark (US 2005/0033549 A1) and further in view of Applicant's admitted prior art.

20. **Regarding claim 6**, Watson, as modified by Yeh and Clark in claim 1, does not teach where the method further comprises the step of providing a control signal from a controller configured to output a control signal to a system of the vehicle to implement corrective action to reduce the potential of an actual rollover when the rollover index is above a predetermined threshold.

21. Applicant's admitted prior art teaches where rollover protection methods may include a step of providing a control signal from a controller to implement corrective action to reduce the potential of an actual rollover when a rollover potential is above a threshold (**see Applicant's specification page 1**).

22.   It would be obvious to one skilled in the art to modify Watson, as modified by

Clark and Yeh, with Applicant's admitted prior art because this can prevent a vehicle

from rolling over rather than simply detect a rollover.

23.   **Regarding claim 7**, Watson, as modified by Yeh and Clark in claim 1 and further

modified by Applicant's admitted prior art in claim 6, teaches where the corrective action

includes at least one of engine torque reduction, a steering wheel angle adjustment, and

a suspension adjustment **(see Applicant's specification pages 1, 2)**.

24.   **Regarding claim 8**, Watson, as modified by Yeh and Clark in claim 1 and further

modified by Applicant's admitted prior art in claim 6, teaches where the engine torque

reduction includes at least one of a change in engine output and actuation of vehicle

brakes **(see Applicant's specification page 1 regarding differential braking**).

25.   Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Watson (US 7057503 B2) in view of Yeh (US 6542073 B2), Clark (US 2005/0033549

A1) and Barta et al. (US 2003/0055549 A1).

26.   **Regarding claim 10**, Watson teaches an apparatus for detecting a rollover event

for a vehicle comprising: a lateral acceleration sensor for sensing a lateral acceleration

of the vehicle **(see Watson figure 16, rollover detection system 10 containing

lateral accelerometer 18; column 3, lines 8-12; column 27, lines 57-60**); a yaw rate

sensor for sensing a yaw rate of the vehicle **(see Watson column 31, lines 9-12**); a

sensor for sensing a speed of the vehicle **(see Watson column 31, lines 9-15**); a

steering wheel sensor for sensing a steering wheel angle of the vehicle **(see Watson

column 31, lines 9-15**).

27.   However, while Watson teaches where a controller is configured to determine a

rollover potential using at least one of the sensed lateral acceleration, yaw rate, vehicle

speed, steering wheel angle, and tire load (**see Watson figure 16, processor 26;**

column 27, lines 30-41; column 28, line 25 thru column 29, line 15), it does not

teach where the apparatus further comprises a tire load sensing mechanism for

measuring a tire load; where the controller is programmed with a dynamic vehicle

model; and where the controller is configured to determine a rollover index from the

sensed values and output a control signal to a system of the vehicle to implement a

corrective action to reduce the potential of an actual rollover when the rollover index is

above the predetermined threshold.

28.   Clark teaches where a rollover detection apparatus may include a tire load

sensing mechanism for measuring a tire load (**see Clark figure 5, loads F_L, F_R and**

paragraphs 8, 29, 30).

29.   It would be obvious to one skilled in the art to add the tire load sensing

mechanism in Clark to the rollover detection apparatus in Watson because a change in

tire pressure within a short period of time can be indicative of an extreme change in

vehicle orientation (**see Clark paragraph 24**).

30.   Yeh teaches where an apparatus for detecting a rollover event for a vehicle

comprises a controller configured to determine a rollover index based on sensed values

and further determine a rollover event when the rollover index is above a predetermined

threshold (**see Yeh column 3, lines 27-41; column 7, line 24 thru column 8, line 17**).

31.   It would be obvious to one skilled in the art to modify the apparatus taught in Watson to create a rollover potentiality index, as taught in Yeh, based on the sensed values in Watson because this enables the use of look-up table of predetermined threshold values responsive to the index values (**see Yeh column 3, lines 27-40**). It would further be obvious for the controller in Watson to be configured to determine if the resulting index is above a predetermined threshold, as further taught in Yeh, because this can signal that a rollover event may occur (**see Yeh column 8, lines 10-15**).

32.   Barta teaches where an apparatus for detecting a rollover event for a vehicle comprises a controller programmed with a dynamic vehicle model (**see Barta paragraphs 4, 5**) and where the controller is configured to output a control signal to a system of the vehicle to implement a corrective action to reduce the potential of an actual rollover when a rollover index is above a predetermined threshold (**see Barta paragraph 134**).

33.   It would be obvious to one skilled in the art to modify the controller in Watson to contain a dynamic vehicle model as taught in Barta because it is well known in the art to use a dynamic vehicle model to compare actual sensor values to estimated values derived from a dynamic vehicle model to determine deviations in desired versus actual driving conditions.

34.   It would further be obvious to modify the controller in Watson to implement a corrective action, as taught in Barta, because this can reduce the potential of a rollover.

35.   **Regarding claim 11**, Watson, as modified by Clark, Yeh and Barta in claim 10, teaches where the corrective action includes at least one of engine torque reduction, a

steering wheel angle adjustment, and a suspension adjustment (**see Barta paragraphs 134, 135**).

36.   **Regarding claim 12**, Watson, as modified by Clark, Yeh and Barta in claim 10, teaches where the engine torque reduction includes at least one of a change in engine output and actuation of vehicle brakes (**see Barta paragraph 134**).

37.   **Regarding claim 13**, Watson, as modified by Clark, Yeh and Barta in claim 10, teaches where the apparatus further comprises an accelerometer attached to a center of gravity of the vehicle for measuring the lateral acceleration of the vehicle (**see Watson column 3, lines 8-12**).

38.   **Regarding claim 14**, Watson, as modified by Clark, Yeh and Barta in claim 10, teaches where the dynamic vehicle model includes a vehicle nominal height and a vehicle half track width (**see Barta paragraph 79**).

Alternate Claim Rejections – 35 USC § 103

1.   Claims 1-2, 5-9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi (US 7165008 B2) in view of Clark (US 2005/0033549 A1).

2.   **Regarding claim 1**, Choi teaches a method for detecting a potential for a vehicle rollover event (**see Choi figure 11**), the method comprising the steps of: determining a lateral kinetic energy of the vehicle based on vehicle longitudinal velocity and vehicle side slip angle (**see Choi figure 11, step 60 and column 7, lines 26-28**); measuring a lateral acceleration of the vehicle (**see Choi figure 11, step 62 and column 7, lines 28-30**); determining a rollover potentiality index based on the lateral kinetic energy and the lateral acceleration (**see Choi figure 11, step 64 and column 7, lines 30-32**);

determining a rollover index by weighting the rollover potentiality index by a factor of the

lateral acceleration (**see Choi figure 11, step 66 and column 7, lines 34-36**);

determining if the rollover index is above a predetermined threshold (**see Choi figure

11, steps 68-70 and column 7, lines 39-42**); and outputting an indication based on the

above determined indexes to a controller adapted to provide a control action in

response thereto (**see Choi figure 11, steps 70-72 and column 7, lines 41-51**).

3.   However, Choi does not teach where the method further comprises: measuring a

tire load and weighting the rollover potentiality index by a factor of the tire load, in

addition to a factor of the lateral acceleration.

4.   Clark teaches a method for detecting a rollover potential for a vehicle that

comprises, in part, measuring a tire load (**see Clark figure 5, loads F_L, F_R and

paragraphs 8, 29, 30**) and weighting a rollover potential by a factor of the tire load (**see

Clark paragraph 22**).

5.   It would be obvious to one skilled in the art to modify the rollover index taught in

Choi, by a factor of the tire load, as taught in Clark, because the tire load can provide a

quick indication of an extreme change in vehicle orientation (**see Clark paragraph 24**).

6.   **Regarding claim 2**, see the rejection of claim 1 above regarding loads F_L, F_R.

7.   **Regarding claims 5-9**, see Choi figures 10, 11 and column 7, lines 5-51; column

3, lines 1-4; column 3, lines 13-15.

8.   **Regarding claim 15**, Choi teaches an apparatus for detecting a rollover event

for a vehicle (**see Choi figure 1 and column 2, lines 33-36**) comprising: a lateral

acceleration sensor for sensing a lateral acceleration of the vehicle (**see Choi figure 1,**

lateral acceleration sensor 18 and column 2, lines 46-48); a yaw rate sensor for sensing a yaw rate of the vehicle (**see Choi figure 1, yaw rate sensor 14 and column 2, lines 44-45**); a sensor for sensing the speed of the vehicle (**see Choi figure 1, wheel sensor 16 and column 2, lines 45-46**); a steering wheel sensor for sensing a steering wheel angle of the vehicle (**see Choi figure 1, steering wheel sensor 20 and column 2, lines 48-49**) and a controller configured to factor the speed of the vehicle and the steering wheel angle of the vehicle into the rollover index determination defined in Claim 1 (**see Choi figure 1, controller 12 and the rejection of claim 1**).

9.   Clark teaches where a tire load sensing mechanism for measuring a tire load (**see Clark figure 5, loads F_L, F_R and paragraphs 8, 29, 30**) may be added to an apparatus for detecting a rollover event (**see Clark paragraphs 7-10 and 16-18**); and a controller configured to factor the speed of the vehicle and the steering wheel angle of the vehicle into the rollover index determination defined in claim 1 (**see the rejection of claim 1 above. See also the rejection of claim 5 above regarding factoring the speed of the vehicle and the steering wheel angle of the vehicle into the rollover index determination defined in claim 1**).

10.   It would be obvious to one skilled in the art to add the tire loading component in Clark to the apparatus in Choi because the tire load can provide a quick indication of an extreme change in vehicle orientation (**see Clark paragraph 24**).

11.   Claims 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi (US 7165008 B2) in view of Clark (US 2005/0033549 A1) and further in view of Mancuso et al. (US 7404317 B2).

12. **Regarding claim 3**, Choi, as modified by Clark in claim 1, does not teach where the measured tire load is determined by measuring a length of a contact patch of a vehicle tire and measuring changes to the contact patch length.

13. Mancuso teaches where a tire load may be determined by measuring a length of a contact patch of a vehicle tire and measuring changes to the contact patch length **(see Mancuso column 7, lines 33-39 and column 10, line 63 thru column 11, line 19 where an accelerometer may be used to estimate the length PL$_C$ of a contact region between a tire and the road. See also column 11, lines 49-65 where the tire load F$_Z$ is derived from the length PL$_C$)**.

14. It would be obvious to one skilled in the art to determine the tire load in Choi, as modified by Clark in claim 1, using the method taught in Mancuso because this method minimizes the effect of the cornering angle and camber angle on the determined tire load **(see Mancuso column 11, lines 12-19)**.

Conclusion

Applicant's amendment necessitated the double patenting rejection and the associated alternate 35 USC 103 obviousness rejections presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this or any earlier communication from the examiner should be directed to Examiner Peter Nolan, whose telephone number is 571-270-7016. The examiner can normally be reached Monday-Friday from 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black, can be reached at 571-272-6956. The fax number for the organization to which this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Peter D Nolan/

Examiner, Art Unit 3661

10/8/2009

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661